

CLAIMS

I claim:

1. A sheet finishing apparatus, comprising:

a media path configured to receive a sheet of media moving along the media path;

a creasing tool disposed proximate the media path and configured to form a crease in the sheet of media; and

a sheet folding device configured to fold the sheet of media along the crease.

2. The sheet finishing apparatus of claim 1, and wherein the creasing tool is configured to operably move from a first position wherein the creasing tool is retracted away from the media path, to a second position wherein the creasing tool can contact a sheet of media moving along the media path and thereby form a crease in the sheet.

3. The sheet finishing apparatus of claim 1, and further comprising a creasing tool actuator configured to cause the creasing tool to form the crease in the sheet of media.

4. The sheet finishing apparatus of claim 3, and wherein the creasing tool actuator comprises an electro-mechanical positioning device.

5. The sheet finishing apparatus of claim 3, and further comprising:

a processor and a computer readable memory device, the computer readable memory device comprising a sheet creasing program configured to be executed by the processor to actuate the sheet creasing actuator.

1 6. A document processing apparatus, comprising:

2 a media path configured to receive a sheet of media moving along the media
3 path;

4 a roller disposed proximate the media path, the roller defined by a length and an
5 outer surface, and having an elongated slot formed therein along at least a portion of the
6 length and opening to the outer surface; and

7 a knife defined by an edge and received within the elongated slot, the knife
8 configured to operably move from a first position wherein the edge is retracted away
9 from the surface of the first roller, to a second position wherein the edge protrudes
10 outward from the surface to thereby contact a sheet of media moving along the media
11 path.

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13 7. The document processing apparatus of claim 6, and wherein the roller is a first
14 roller, the apparatus further comprising a second roller defined by a length and an outer
15 surface, and having an elongated slot formed therein along at least a portion of the
16 length and opening to the outer surface, the second roller disposed essentially parallel to
17 the first roller and proximate the media path such that a sheet of media moving along the
18 media path passes between the first roller and the second roller, and wherein the edge
19 of the knife is configured to be received within the elongated slot in the second roller.

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21 8. The document processing apparatus of claim 7, and further comprising a
22 creasing anvil disposed within the second roller and operably moveable from a first
23 position away from the elongated slot to a second position in the elongated slot near the
24 surface of the second roller, and wherein when the knife is in the second position, the
25 first knife edge contacts the creasing anvil to thereby crease a sheet of media moving
26 between the first and second rollers.

1 9. The document processing apparatus of claim 8, and further comprising a cutting
2 anvil disposed within the second roller and operably moveable from a first position away
3 from the elongated slot to a second position in the elongated slot near the surface of the
4 second roller, and wherein when the knife is in the second position, the knife edge
5 contacts the cutting anvil to thereby cut a sheet of media moving between the first and
6 second rollers.

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8 10. The document processing apparatus of claim 7, and wherein the knife is a first
9 knife, and further wherein the second roller comprises a second knife defined by an
10 edge and received within the elongated slot of the second roller, the second knife
11 configured to operably move from a first position wherein the edge is retracted away
12 from the surface of the second roller to a second position wherein the edge protrudes
13 outward from the surface to thereby contact a sheet of media moving along the media
14 path, and wherein the edge of the knife is configured to be received within the elongated
15 slot in the first roller.

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17 11. The document processing apparatus of claim 6, and wherein the roller further
18 comprises a cam disposed within the elongated slot and in contact with the knife, the
19 cam configured to slidably move along a portion of the length of the roller and thereby
20 operably move the knife from the first position to the second position.

1 12. The document processing apparatus of claim 6, and wherein the knife edge is
2 configured to contact the sheet of media in the media path at a crease line defined on
3 the media, the apparatus further comprising a pinch device configured to operably move
4 from a first position away from the media path to a second position proximate the media
5 path to thereby contact a sheet of media moving along the media path from the first
6 roller to the pinch device, and wherein the pinch device is configured to move to the
7 second position to contact the sheet of media at essentially the crease line.

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9 13. The document processing apparatus of claim 12, and further comprising a pair of
10 fold rollers configured to engage the sheet of media essentially along the crease line
11 after the sheet has been contacted by the pinch device.

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13 14. The document processing apparatus of claim 6, and further comprising:
14 a knife actuator configured to move the knife from the first position to the second
15 position; and
16 a processor configured to actuate the knife actuator and move the knife to the
17 second position in response to receiving an instruction to form a crease at a crease line
18 on a sheet of media moving along the media path.

1 15. A method of folding a sheet of media, comprising automatically:
2 providing a sheet of media;
3 forming a crease on the sheet of media along a crease line to thereby define first
4 and second portions of the sheet, each portion being defined by the crease line;
5 urging the sheet towards a nip by pressing the sheet of media essentially along
6 the crease while supporting the first and second portions of the sheet; and
7 at the nip, grasping the sheet at essentially the crease line and urging the first
8 portion of the sheet towards the second portion of the sheet.

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10 16. The method of claim 15, and wherein the crease is a first crease, the nip is a first
11 nip, and the crease line is a first crease line, the method further comprising:
12 forming a second crease on the sheet of media along a second crease line to
13 thereby define a third portion of the sheet defined by the second crease line;
14 urging the sheet towards a second nip by pressing the sheet of media essentially
15 along the second crease while supporting at least one of the first and second portions of
16 the sheet, and also supporting the third portion of the sheet; and
17 at the second nip, grasping the sheet at essentially the second crease line and
18 urging the third portion of the sheet towards the first and second portions of the sheet.

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20 17. The method of claim 16, and wherein the sheet of media is defined by first and
21 second sides, and wherein the first crease is formed by pressing a first elongated
22 member against the first side of the sheet, and the second crease is formed by pressing
23 a second elongated member against the second side of the sheet.

1 18. The method of claim 15, and wherein the crease is formed at a creasing location,
2 and is formed by pressing an elongated creasing member against the sheet, the method
3 further comprising, prior to forming the crease, simultaneously moving the sheet of
4 media and the elongated creasing member to the creasing location.

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6 19. The method of claim 15, and wherein the crease is formed by pressing an
7 elongated creasing member against the sheet, the method further comprising, prior to
8 forming the crease, heating the elongated creasing member.

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10 20. A sheet finishing apparatus configured to be used in conjunction with a sheet
11 imaging apparatus, comprising:

12 a media path configured to receive a sheet of media from the imaging apparatus;
13 a drive mechanism configured to move a sheet of media along the media path in
14 a media path direction; and
15 an elongated member defined by an edge, the elongated member oriented
16 perpendicular to the media path direction and configured to operably move from a first
17 position away from the media path to a second position wherein the edge of the
18 elongated member can contact a sheet of media moving along the media path.

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20 21. The sheet finishing apparatus of claim 20, and wherein the elongated member
21 contacts a sheet of media along a crease line, the apparatus further comprising a sheet
22 folding device configured to receive a sheet of media after the sheet has been contacted
23 by the elongated member, and to fold the sheet along the crease line.

1 22. The sheet finishing apparatus of claim 21, and further comprising:
2 a processor;
3 a sheet folding device actuator configured to cause the sheet folding device to
4 fold a sheet of media;
5 an encoder configured to determine the position of the contact line and to
6 communicate the position to the processor; and
7 wherein the processor is configured to actuate the sheet folding device actuator
8 when the contact line is determined by the processor to be in a preselected position
9 relative to the sheet folding device.

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11 23. The sheet finishing apparatus of claim 20, and wherein the elongated member is
12 configured to crease a sheet of media when the elongated member is in the second
13 position and contacts a sheet of media in the media path.

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15 24. The sheet finishing apparatus of claim 20, and wherein the elongated member is
16 configured to cut a sheet of media when the elongated member is in the second position
17 and contacts a sheet of media in the media path.

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19 25. The sheet finishing apparatus of claim 20, and wherein the elongated member a
20 first elongated member, and the first elongated member is configured to contact a sheet
21 of media on a first side of the sheet of media, the apparatus further comprising:

22 a second elongated member defined by an edge, the second elongated member
23 oriented perpendicular to the media path direction and configured to operably move from
24 a first position away from the media path to a second position wherein the edge of the
25 second elongated member can contact a second side of a sheet of media moving along
26 the media path.